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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,300	02/18/2004	Sung Tae Lee	U 015031-8	4812

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Ladas & Parry
26 West 61st Street
New York, NY 10023

EXAMINER	
BERTHEAUD, PETER JOHN	
ART UNIT	PAPER NUMBER
3746	

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/781,300	LEE, SUNG TAE	
	Examiner	Art Unit	
	Peter J. Bertheaud	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/18/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim 6,948,418 in view of Iversen 6,702,067.

Kim discloses a hermetic reciprocating compressor comprising: a hollow frame 310; a rotating shaft 230 placed in a hollowed part of the frame so as to rotate relative to the frame; an eccentric part 240 provided on the rotating shaft so as to eccentrically rotate; a piston 340 to rectilinearly move, in response to an eccentric rotation of the eccentric part; a cylinder 321 provided on an upper end of the hollow frame so as to allow the piston to compress a fluid in the cylinder; a bearing seat 312 provided on an upper end of the hollowed part of the frame; a thrust bearing 410 seated in the bearing seat so as to support the eccentric part; an oil path 231 provided in the rotating shaft so as to guide oil upward. However, Kim fails to disclose an oil discharge hole to communicating with the oil path, that would discharge the oil to an outer surface of the rotating shaft; along with an oil slot being provided in the bearing seat, that would allow the oil discharged from the oil discharge hole to flow through the oil slot.

Iversen teaches a piston compressor assembly including a crankshaft 2, a bearing seat 12, and an oil path 15 for directing oil upward. Iversen further discloses an

oil discharge hole 16 to communicate with the oil path 15, thus discharging the oil to an outer surface of the rotating shaft; and an oil slot 36 provided in the bearing seat, thus allowing the oil discharged from the oil discharge hole to flow through the oil slot. Iversen teaches that this would be advantageous because it improves lubrication.

Therefore, it would have been obvious to one skilled in the art at the time of invention to modify the reciprocating compressor of Kim by including an oil discharge hole to communicate with the oil path and an oil slot provided in the bearing seat, as taught by Iversen, in order to improve lubrication (see col. 2, lines 2-15).

3. Claims 2, 5, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim 6,948,418 in view of Iversen 6,702,067 and in further view of Joo 6,419049.

Kim in view of Iversen disclose the invention as discussed above. Kim also discloses a depression 313 extending on a bottom surface of the bearing seat in a radial direction. Therefore, Kim in view of Iversen disclose the invention as claimed except for the following limitations taught by Joo.

Joo teaches a main shaft bearing lubricating apparatus for a seal-type reciprocating compressor including a bearing seat 1, a rotary shaft 6, an oil slots 3, and a thrust washer 8. Joo further teaches that an oil slot 3 extends on the bearing seat in a radial direction. Joo also teaches that the oil slot comprises a plurality of oil slots 3 which are formed on the bearing seat while being spaced apart from each other at predetermined angular intervals (see Fig. 1). Joo also discloses that the oil slot is shaped in a helical manner, with a width of the oil slot reducing in a direction from an oil inlet to an oil outlet of the oil slot (see Fig. 1 and see col. 3, lines 19-21). Joo teaches

that these aspects of the invention would be advantageous because they provide sufficient lubricating oil.

Therefore, it would have been obvious to one skilled in the art at the time of invention to modify the reciprocating compressor of Kim in view of Iversen by including many oil slots to carry oil in a radial direction, as taught by Joo, in order to provide sufficient lubrication (see col. 2, lines 1-10).

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim 6,948,418 in view of Iversen 6,702,067 and in further view of Joo 6,419049 and still in further view of Newberg 5,857,780.

Kim in view of Iversen and Joo disclose the invention as discussed above. However, Kim in view of Iversen and Joo do not show the bearing seat comprising an inclined surface which is formed around the bottom surface of the bearing seat while being inclined upward and outward, that has a diameter of the inclined surface increasing in an outward direction from an inside edge to an outside edge of the inclined surface.

Newberg teaches a spherical bearing assembly including a bearing seat 50, a shaft 84, and a bearing 52. Newberg further discloses that the bearing seat comprises an inclined surface which is formed around the bottom surface of the bearing seat while being inclined upward and outward (see Fig. 5), with a diameter of the inclined surface increasing in an outward direction from an inside edge to an outside edge of the inclined surface (see Fig. 5). Newberg teaches that this would be advantageous because the bearing seat surface is complimentary to the bearing surface.

Therefore, it would have been obvious to one skilled in the art at the time of invention to modify the reciprocating compressor of Kim in view of Iversen and Joo by inclining the surface of the bearing seat, as taught by Newberg, in order to make the baring seat surface complimentary to the bearing (see col. 6, lines 1-7).

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim 6,948,418 in view of Iversen 6,702,067, Joo 6,419049, Newberg 5,857,780, and in further view of Phillips 4,717,263 and Kimura 4,772,128.

Kim in view of Iversen, Joo and Newberg disclose the invention as discussed above. However, Kim in view of Iversen, Joo and Newberg do not show the oil slot extending to the inclined surface of the bearing seat and to an edge of the hollowed part of the frame, thus having extension slot parts with predetermined lengths.

Phillips discloses a gas bearing including a bearing seat (see Fig. 9) with an inclined surface and exhaust slots 132. Phillips further discloses that the oil slots extend to the inclined surface of the bearing seat and to an edge of the hollowed part of the frame (see Fig. 9). Phillips teaches that this would be advantageous because the slots create divisions in the bearing seat, or bearing pockets, that contribute to optimal incoming and outgoing fluid flow characteristics.

Therefore, it would have been obvious to one skilled in the art at the time of invention to modify the reciprocating compressor of Kim in view of Iversen, Joo, and Newberg by extending the slots in the bearing seat from the edge of the hollowed frame to the inclined surface, as taught by Phillips, in order to create optimal incoming and outgoing fluid flow (see col. 2, lines 19-22).

Kim in view of Iversen, Joo, Newberg and Phillips teaches the invention as claimed except for the bearing seat having extension slot parts with predetermined lengths.

Kimura teaches a scroll compressor with oil grooves in a thrust bearing including a hollowed out middle portion and oil slots 32j. Kimura further teaches that the oil slots extend from the hollowed part of the frame to an outer portion of the bearing where an extension slot part 32k is formed by shallowing the depth of the slot (see Figs. 4a and 4b). Kimura teaches that this would be advantageous because it increases the resistance in the flow path.

Therefore, it would have been obvious to one skilled in the art at the time of invention to modify the reciprocating compressor of Kim in view of Iversen, Joo, Newberg, and Phillips by creating an extension slot part, as taught by Kimura, in order to uniformly lubricate the bearing surface (see col. 8, lines 41-51).

Conclusion

6. The prior art made of record, noted in the attached form 892, and not relied upon is considered pertinent to applicant's disclosure.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J. Bertheaud whose telephone number is (571) 272-3476. The examiner can normally be reached on M-F 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on (571) 272-4828. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PJB 12/1/06

EHUD GARTENBERG
SUPERVISORY PATENT EXAMINER